CONTROL OF SCANNING VELOCITY MODULATION AT MULTIPLE SCANNING FREQUENCIES

This invention relates to scanning velocity modulation (SVM) systems and more particularly to the automatic control of scanning velocity modulation signal amplitude at multiple scanning frequencies.

BACKGROUND OF THE INVENTION

It is well known that in a cathode ray tube display an improvement in apparent picture sharpness can be achieved by modulating the scanning velocity of an electron beam in accordance with the derivative of the luminance portion of the display signal. This derivative signal, or scan velocity modulation signal, can be derived from the luminance portion of the video signal and identifies when scanning beam velocity variations should be employed. Slowing of the scanning velocity of the electron beam causes a greater number of electrons to land at a particular point in the display resulting in brightening of the video monitor display at that particular location on the display. Conversely, accelerating the scanning velocity at a particular portion of the screen results in display darkening. Thus, horizontal rate edges may be visually enhanced by variations in the display intensity at edge transitions caused by the variation of the electron beam speed. This method of picture sharpness enhancement has advantages over a peaking approach to picture sharpness enhancement such as an avoidance of blooming of peaked high luminance (white) picture elements and an avoidance of enhancement of video noise occurring within the bandwidth of the peaked signals.

SVM systems, such as those described above, are well known for use in television systems, but they are typically not used in computer monitors. SVM systems are generally not well suited for use in monitors that display video signals of various different formats such as VGA, or SVGA which may use alternative scanning frequencies. The horizontal scanning rates of these video formats can be anywhere from 2 to 2.4 times as great as an NTSC horizontal scanning frequency. With the convergence of the television and the computer monitor, SVM is starting to be used under much more demanding conditions. For example, multimedia monitors are becoming available that are also capable of

FIGURE 2 depicts in block diagram form an SVM automatic gain control system for adjusting SVM signal amplitude to be with in a predetermined amplitude range when operating with video formats having different spatial resolution and different scanning frequencies. In FIGURE 2, a video signal which includes horizontal frequency information is applied to derivative circuit 1. In derivative circuit 1, the luminance component of the video signal is differentiated to produce an SVM signal. The output of derivative circuit 1 is coupled to variable gain amplifier 2. There, the SVM signal is amplified and is used generate a deflection current in the SVM coil for modulating the beam scanning velocity.

According to a preferred embodiment of the invention, scanning frequency detector 3 makes use of a portion of the input signal containing horizontal scanning frequency information to provide an indicator of likely spatial frequency content of the input signal. In simple terms, FIGURE 1 shows the increase in SVM signal amplitude that occurs with a doubling of input frequency. Since an exemplary ATSC image is capable of at least double the horizontal resolution of an NTSC signal, an SVM amplitude control system based on horizontal sync frequency determination provides a reliable indication of the spectral content of the displayed image.

To control the gain or SVM signal amplitude generated by amplifier 2 the horizontal scanning frequency is monitored and when it increases above 1H, a control signal from scan frequency detector 3 causes the SVM signal from amplifier 2 to be reduced in amplitude. Furthermore, SVM signal gain and or amplitude control can be applied generally in accordance with a complementary or inverse transfer function to that depicted in FIGURE 1. Thus, gain, or SVM amplitude, is preferably halved for signals having double frequency scanning rates. Conversely, SVM amplitude or gain can similarly be increased for a corresponding decrease in horizontal scanning frequency.

FIGURE 3 is a detailed circuit diagram showing an embodiment of the SVM automatic gain control system of FIGURE 2. As shown in FIGURE 3, a luminance signal with negative going horizontal sync is applied to the input of the circuit. This signal can be provided by horizontal sync, luminance (Y) with

CLAIMS

1. A method for controlling scan velocity modulation in a video display apparatus operable at a plurality of horizontal scanning frequencies, comprising the steps of:

a) generating respective scanning velocity modulation signals from signals having a plurality of horizontal scanning frequencies and coupled for display by said apparatus; and,

b) selectively controlling an amplitude of each respective scanning velocity modulation signal to a predetermined range of amplitudes.

2. The method according to claim 1, comprising a further step of:

generating a control signal in accordance with a horizontal scanning frequency of said each respective scanning velocity modulation signal for controlling said amplitude to said predetermined range of amplitudes.

3. The method according to claim 1, comprising a further step of:

selecting a different one of said plurality of horizontal scanning frequencies and reducing said amplitude of a scanning velocity modulation signal in accordance with said different one having a horizontal scanning frequency greater than a horizontal scanning frequency of a prior selection

4 A method for controlling scan velocity modulation in a video display apparatus operable at a plurality of horizontal scanning frequencies, comprising the steps of:

determining a horizontal scanning frequency of a signal coupled for display by said apparatus;

generating from said signal coupled for display by said apparatus, a scanning velocity modulation signal having an amplitude representative of said horizontal scanning frequency of said signal coupled for display; and,

selectively controlling said amplitude of said scanning velocity modulation signal responsive to said determining step.

5. A method for controlling scan velocity modulation in a video display apparatus operable at a plurality of horizontal scanning frequencies, comprising the steps of:

generating from a signal coupled for display by said apparatus a scanning velocity modulation signal having an amplitude representative of a horizontal scanning frequency of said signal coupled for display;

determining said horizontal scanning frequency of said signal coupled for display;

generating a control signal in accordance with said determined scanning frequency; and,

controlling responsive to said control signal said amplitude of said scanning velocity modulation signal such that said amplitude is substantially independent of said determined scanning frequency.

6. The method according to claim 5, comprising a further step of:

reducing said amplitude as the frequency of said horizontal scanning frequency is increased.

7. The method according to claim 6, wherein said amplitude is approximately halved for each octave increase in said determined horizontal scanning frequency.

8. The method according to claim 5, wherein said control signal generating step comprises the step of;

representing said determined horizontal scanning frequency with a DC voltage that varies proportionally as a function of said determined horizontal scanning frequency.

9. The method according to claim 8, comprising the step of;

controlling said amplitude of said scanning velocity modulation signal responsive to said DC voltage.

10. The method according to claim 5, wherein said control signal generating step comprises the step of;

representing said determined horizontal scanning frequency with a digital signal generated by a microprocessor.

11. The method according to claim 10 comprises the step of;

controlling said amplitude of said scanning velocity modulation signal responsive to said digital signal.

12. A video display apparatus with scan velocity modulation and operable at a plurality of scanning frequencies comprising:

means for generating a scan velocity modulation signal from a display signal coupled to said apparatus, said scanning velocity modulation signal having an amplitude directly related to a horizontal scanning frequency of said display signal;

means for determining said horizontal scanning frequency;

means for generating a control signal responsive to said determined horizontal scanning frequency; and,

means responsive to said control signal for selectively controlling said amplitude of said scanning velocity modulation signal to maintain said scan velocity modulation signal amplitude substantially independent of said determined horizontal scanning frequency.

13. The video display apparatus according to claim 12, wherein said means for selectively controlling reduces said amplitude of said scanning velocity modulation signal in accordance a frequency increase of said determined horizontal scanning frequency.

14. The video display apparatus according to claim 12, wherein said means for selectively controlling halves said amplitude of said scanning velocity modulation signal for each octave increase in said determined horizontal scanning frequency.

15. The video display apparatus according to claim 12, wherein said control signal representing said determined horizontal scanning frequency is a DC voltage that varies proportionally as a function of said determined horizontal scanning frequency.

16. The video display apparatus according to claim 12, wherein said control signal representing said determined horizontal scanning frequency is a digital signal generated by a microprocessor.

17. The video display apparatus according to claim 16, wherein said digital signal sets a gain register to control said amplitude of said scanning velocity modulation signal.

FOR THE PURPOSES OF INFORMATION ONLY

Codes used to identify States party to the PCT on the front pages of pamphlets publishing international applications under the PCT.

AL	Albania	**ES**	Spain	**LS**	Lesotho	**SI**	Slovenia
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CONTROL OF SCANNING VELOCITY MODULATION AT MULTIPLE SCANNING FREQUENCIES

This invention relates to scanning velocity modulation (SVM) systems and more particularly to the automatic control of scanning velocity modulation signal amplitude at multiple scanning frequencies.

BACKGROUND OF THE INVENTION

It is well known that in a cathode ray tube display an improvement in apparent picture sharpness can be achieved by modulating the scanning velocity of an electron beam in accordance with the derivative of the luminance portion of the display signal. This derivative signal, or scan velocity modulation signal, can be derived from the luminance portion of the video signal and identifies when scanning beam velocity variations should be employed. Slowing of the scanning velocity of the electron beam causes a greater number of electrons to land at a particular point in the display resulting in brightening of the video monitor display at that particular location on the display. Conversely, accelerating the scanning velocity at a particular portion of the screen results in display darkening. Thus, horizontal rate edges may be visually enhanced by variations in the display intensity at edge transitions caused by the variation of the electron beam speed. This method of picture sharpness enhancement has advantages over a peaking approach to picture sharpness enhancement such as an avoidance of blooming of peaked high luminance (white) picture elements and an avoidance of enhancement of video noise occurring within the bandwidth of the peaked signals.

In Japanese Patent 61-099467 and PAJ vol. 010, No. 279 a multiscan TV receiver is disclosed which employs scanning beam velocity modulation by modulating the voltage applied to a fourth grid of the CRT. The reference also teaches that the velocity modulating voltage applied to the CRT grid is also applied to a peak to peak detector (83). The output from detector (83) is coupled to an AGC circuit (82) which controls the amplitude of the velocity modulating voltage applied to the CRT. In this way a closed loop is formed which maintains the peak to peak value of the velocity modulating voltage at a prescribed amount. Separated horizontal syncs are fed to

discriminator (84) which produces an output signal that is applied to control a time constant of AGC circuit (82).

A TV receiver which employs scanning beam velocity modulation by means of a magnetic deflection coil is disclosed in US Patent 5982449 and EPO 784 402 A2. A signal for SVM signal derivation is coupled via a digital filtering means (12) which is programmed by CPU (3) based on information derived from the format or content of the input signal selected for display. In this way the sharpness of the displayed image is adapted to the input signal selected. This reference also discloses the use of an SVM driver current feedback loop where driver current is converted to a digital signal and coupled to CPU (3) to change the characteristic of the programmable filter means (12).

SVM systems, such as those described above, are well known for use in television systems, but they are typically not used in computer monitors. SVM systems are generally not well suited for use in monitors that display video signals of various different formats such as VGA, or SVGA which may use alternative scanning frequencies. The horizontal scanning rates of these video formats can be anywhere from 2 to 2.4 times as great as an NTSC horizontal scanning frequency. With the convergence of the television and the computer monitor, SVM is starting to be used under much more demanding conditions. For example, multimedia monitors are becoming available that are also capable of

FIGURE 2 depicts in block diagram form an open loop SVM automatic gain control system for adjusting SVM signal amplitude to be with in a predetermined amplitude range when operating with video formats having different spatial resolution and different scanning frequencies. In FIGURE 2, a video signal which includes horizontal frequency information is applied to derivative circuit 1. In derivative circuit 1, the luminance component of the video signal is differentiated to produce an SVM signal. The output of derivative circuit 1 is coupled to variable gain amplifier 2. There, the SVM signal is amplified and is used generate a deflection current in the SVM coil for modulating the beam scanning velocity.

According to a preferred embodiment of the invention, scanning frequency detector 3 makes use of a portion of the input signal containing horizontal scanning frequency information to provide an indicator of likely spatial frequency content of the input signal. In simple terms, FIGURE 1 shows the increase in SVM signal amplitude that occurs with a doubling of input frequency. Since an exemplary ATSC image is capable of at least double the horizontal resolution of an NTSC signal, an open loop feed forward SVM amplitude control signal based on horizontal sync frequency determination provides a reliable indication of the spectral content of the displayed image.

To control the gain or SVM signal amplitude generated by amplifier 2 the horizontal scanning frequency is monitored and when it increases above 1H, the feed forward control signal from scan frequency detector 3 causes the SVM signal from amplifier 2 to be reduced in amplitude. Furthermore, open loop SVM signal gain and or amplitude control can be applied generally in accordance with a complementary or inverse transfer function to that depicted in FIGURE 1. Thus, gain, or SVM amplitude, is preferably halved for signals having double frequency scanning rates. Conversely, SVM amplitude or gain can similarly be increased for a corresponding decrease in horizontal scanning frequency.

FIGURE 3 is a detailed circuit diagram showing an embodiment of the SVM automatic gain control system of FIGURE 2. As shown in FIGURE 3, a luminance signal with negative going horizontal sync is applied to the input of the circuit. This signal can be provided by horizontal sync, luminance (Y) with

CLAIMS

1. A video display apparatus, operable at a plurality scanning frequencies and including scanning beam velocity modulation, comprising:

a controllable scanning velocity modulation signal amplifier for generating an scanning velocity modulation deflection signal responsive to a scanning velocity modulation signal; and,

means for generating a control signal coupled to said amplifier for open loop control of said scanning velocity modulation deflection signal in amplitude responsive to selected ones of said plurality of scanning frequencies.

2. The video display apparatus of claim 1, wherein said control signal reduces said scanning velocity modulation deflection signal amplitude in accordance with an increasing scanning frequency of said plurality of scanning frequencies.

3. The method according to claim 1, comprising a further step of:

selecting a different one of said plurality of horizontal scanning frequencies and reducing said amplitude of a scanning velocity modulation signal in accordance with said different one having a horizontal scanning frequency greater than a horizontal scanning frequency of a prior selection.

4. A method for controlling scan velocity modulation in a video display apparatus operable at a plurality of horizontal scanning frequencies, comprising the steps of:

generating from a signal coupled for display by said apparatus a scanning velocity modulation signal with a range of amplitudes representative of a horizontal scanning frequency of said signal coupled for display;

determining said horizontal scanning frequency of said signal coupled for display;

generating a control signal in accordance with said determined scanning frequency to maintain said scanning velocity modulation signal within said range of amplitudes substantially independent of said horizontal scanning frequency of said signal coupled for display.

5. The method according to claim 5, wherein said control signal generating step comprises the step of;

representing said determined horizontal scanning frequency with a DC voltage that varies proportionally as a function of said determined horizontal scanning frequency.

6. The method according to claim 8, comprising the step of;

controlling said amplitude of said scanning velocity modulation signal responsive to said DC voltage.

7. The method according to claim 5, wherein said control signal generating step comprises the step of;

representing said determined horizontal scanning frequency with a digital signal generated by a microprocessor.

8. The method according to claim 10 comprises the step of;

controlling said amplitude of said scanning velocity modulation signal responsive to said digital signal.

9. A video display apparatus with scan velocity modulation and operable at a plurality of scanning frequencies comprising:

means for generating a scan velocity modulation signal from a display signal coupled to said apparatus, said scanning velocity modulation signal having an amplitude range;

means for determining said horizontal scanning frequency of said display signal;

means for generating a control signal responsive to said determined horizontal scanning frequency; and,

a differential amplifier responsive to said control signal for selectively controlling said scanning velocity modulation signal to maintain said scan velocity modulation signal within said amplitude range substantially independent of said determined horizontal scanning frequency.

10. The video display apparatus according to claim 12, wherein said means for selectively controlling reduces said amplitude of said scanning velocity modulation signal in accordance a frequency increase of said determined horizontal scanning frequency.

11. The video display apparatus according to claim 12, wherein said means for selectively controlling halves said amplitude of said scanning velocity modulation signal for each octave increase in said determined horizontal scanning frequency.

12. The video display apparatus according to claim 12, wherein said control signal representing said determined horizontal scanning frequency is a DC voltage that varies proportionally as a function of said determined horizontal scanning frequency.

13. The video display apparatus according to claim 12, wherein said control signal representing said determined horizontal scanning frequency is a digital signal generated by a microprocessor.

14. The video display apparatus according to claim 16, wherein said digital signal sets a gain register to control said amplitude of said scanning velocity modulation signal.

PATENT COOPERATION TREATY

09/913097

From the
INTERNATIONAL PRELIMINARY EXAMINING AUTHORITY

To:

TRIPOLI, Joseph S.
THOMSON MULTIMEDIA LICENSING INC.
P.O. Box 5312
Princeton, New Jersey 08540
ETATS-UNIS D'AMERIQUE

PCT

NOTIFICATION OF TRANSMITTAL OF
THE INTERNATIONAL PRELIMINARY
EXAMINATION REPORT
(PCT Rule 71.1)

Date of mailing *(day/month/year)*	16.02.2001
Applicant's or agent's file reference RCA 89383	**IMPORTANT NOTIFICATION**

International application No.	International filing date *(day/month/year)*	Priority date *(day/month/year)*
PCT/US00/02989	04/02/2000	09/02/1999

Applicant
THOMSON LICENSING S.A. et al.

1. The applicant is hereby notified that this International Preliminary Examining Authority transmits herewith the international preliminary examination report and its annexes, if any, established on the international application.

2. A copy of the report and its annexes, if any, is being transmitted to the International Bureau for communication to all the elected Offices.

3. Where required by any of the elected Offices, the International Bureau will prepare an English translation of the report (but not of any annexes) and will transmit such translation to those Offices.

4. **REMINDER**

The applicant must enter the national phase before each elected Office by performing certain acts (filing translations and paying national fees) within 30 months from the priority date (or later in some Offices) (Article 39(1)) (see also the reminder sent by the International Bureau with Form PCT/IB/301).

Where a translation of the international application must be furnished to an elected Office, that translation must contain a translation of any annexes to the international preliminary examination report. It is the applicant's responsibility to prepare and furnish such translation directly to each elected Office concerned.

For further details on the applicable time limits and requirements of the elected Offices, see Volume II of the PCT Applicant's Guide.

Name and mailing address of the IPEA/	Authorized officer
European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465	SCHALINATUS, D Tel.+49 89 2399-8242

09/913097

PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

14

Applicant's or agent's file reference	FOR FURTHER ACTION	See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)
RCA 89383		
International application No.	International filing date *(day/month/year)*	Priority date *(day/month/year)*
PCT/US00/02989	04/02/2000	09/02/1999
International Patent Classification (IPC) or national classification and IPC H04N3/32		
Applicant THOMSON LICENSING S.A. et al.		

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.

2. This REPORT consists of a total of 5 sheets, including this cover sheet.

   ☒ This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

   These annexes consist of a total of 6 sheets.

3. This report contains indications relating to the following items:

   - I ☒ Basis of the report
   - II ☐ Priority
   - III ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
   - IV ☐ Lack of unity of invention
   - V ☒ Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations suporting such statement
   - VI ☐ Certain documents cited
   - VII ☒ Certain defects in the international application
   - VIII ☒ Certain observations on the international application

Date of submission of the demand	Date of completion of this report
24/08/2000	16.02.2001
Name and mailing address of the international preliminary examining authority: European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465	Authorized officer Glendinning, D Telephone No. +49 89 2399 2443

Form PCT/IPEA/409 (cover sheet) (January 1994)

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No. PCT/US00/02989

I. Basis of the report

1. This report has been drawn on the basis of *(substitute sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to the report since they do not contain amendments (Rules 70.16 and 70.17).)*:
Description, pages:

2-4,6-11	as originally filed			
1,1a,5	as received on	26/01/2001	with letter of	24/01/2001

Claims, No.:

1-14	as received on	26/01/2001	with letter of	24/01/2001

Drawings, sheets:

1/4-4/4	as originally filed

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

   These elements were available or furnished to this Authority in the following language: , which is:

   - ☐ the language of a translation furnished for the purposes of the international search (under Rule 23.1(b)).
   - ☐ the language of publication of the international application (under Rule 48.3(b)).
   - ☐ the language of a translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

   - ☐ contained in the international application in written form.
   - ☐ filed together with the international application in computer readable form.
   - ☐ furnished subsequently to this Authority in written form.
   - ☐ furnished subsequently to this Authority in computer readable form.
   - ☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
   - ☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. The amendments have resulted in the cancellation of:

- ☐ the description, pages:
- ☐ the claims, Nos.:
- ☐ the drawings, sheets:

5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)):

   (Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.)

6. Additional observations, if necessary:

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes:	Claims	1-14
	No:	Claims	
Inventive step (IS)	Yes:	Claims	1-14
	No:	Claims	
Industrial applicability (IA)	Yes:	Claims	1-14
	No:	Claims	

2. Citations and explanations
   see separate sheet

VII. Certain defects in the international application

The following defects in the form or contents of the international application have been noted:
see separate sheet

VIII. Certain observations on the international application

The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:
see separate sheet

V Reasoned statement under Article 35(2) PCT

1 Claim 1 relates to a video display apparatus operable at different scanning frequencies and employing scanning velocity modulation (SVM). An SVM signal amplifier produces a scanning velocity modulation signal corresponding to a particular input signal and a control signal is supplied to the amplifier, the control signal depending on the frequency of the input signal. This overcomes the problem caused by the modulating signal increasing in value with an increase in the input frequency. An open loop control of the modulating signal is provided. The closest prior art is EP-A-0 784 402. This employs a programmable filter in place of an amplifier to produce the modulating signal, the programming being effected in dependence on the input frequency. There is also a gain adjusting means in the open-loop system of figure 6 of the EP document, but no disclosure of its function or how it is controlled. Nor is there any awareness in the EP document that the modulating signal increases with increasing input frequency. None of the other documents cited in the Search Report would suggest modifying the system of the EP document in such a way as to make it fall within the terms of claim 1. The subject matter of claim 1 can thus be regarded as new and as having inventive step.

2 Independent claims 4 and 9 perform basically the same function as the system of claim 1. They generate modulating signals within a range of amplitudes in dependence on the various input scanning frequencies, they measure the input frequency and use the measurement to produce a control signal, the control signal being used to keep the output modulating signal at a value within that range and substantially independent of the input scanning frequency. There is no clear disclosure or suggestion in the prior art documents cited in the Search Report of measuring the input scanning frequency to produce a control signal which is then used to keep the modulating signal fed to the display substantially independent of the input scanning frequency. The subject matter of claims 4 and 9 can thus be considered to be new and to have inventive step.

3 The subject matter of dependent claims 2,3, 5-8 and 10-14 can likewise be considered to be new and to have inventive step.

4 The claimed invention finds industrial applicability in the technical field of video displays.

VII Certain defects in the international application

1 The independent claims should be drafted in two-part form with respect to the disclosure of the closest prior art document, e.g. EP-A-0 784 402 or PAJ, vol. 10, no. 279(E-439) & JP 61 099467 {Rule 6.3(b)}.

2 The Summary of the Invention on page 3 should be brought into line with the new independent claims {Rule 5.1(a)(iii)}.

VIII Certain observations on the international application

Claims 10-13 should all be dependent on claim 9 and claim 14 should be dependent on claim 13.

From the INTERNATIONAL BUREAU

PCT

NOTIFICATION OF ELECTION

(PCT Rule 61.2)

To:

Assistant Commissioner for Patents
United States Patent and Trademark Office
Box PCT
Washington, D.C.20231
ETATS-UNIS D'AMERIQUE

in its capacity as elected Office

Date of mailing (day/month/year) 10 October 2000 (10.10.00)	
International application No. PCT/US00/02989	**Applicant's or agent's file reference** RCA 89383
International filing date (day/month/year) 04 February 2000 (04.02.00)	**Priority date** (day/month/year) 09 February 1999 (09.02.99)
Applicant – ALLENDER, Jeffrey, Owen et al	

1. The designated Office is hereby notified of its election made:

[X] in the demand filed with the International Preliminary Examining Authority on:

24 August 2000 (24.08.00)

[ ] in a notice effecting later election filed with the International Bureau on:

2. The election [X] was

[ ] was not

made before the expiration of 19 months from the priority date or, where Rule 32 applies, within the time limit under Rule 32.2(b).

The International Bureau of WIPO
34, chemin des Colombettes
1211 Geneva 20, Switzerland

Facsimile No.: (41-22) 740.14.35

Authorized officer

R. Forax

Telephone No.: (41-22) 338.83.38

PATENT COOPERATION TREATY

PCT

09/913097

INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference	FOR FURTHER ACTION	see Notification of Transmittal of International Search Report (Form PCT/ISA/220) as well as, where applicable, item 5 below.
RCA 89383		
International application No.	International filing date *(day/month/year)*	(Earliest) Priority Date *(day/month/year)*
PCT/US 00/02989	04/02/2000	09/02/1999
Applicant		
THOMSON LICENSING S.A. et al.		

This International Search Report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This International Search Report consists of a total of 3 sheets.

[X] It is also accompanied by a copy of each prior art document cited in this report.

1. **Basis of the report**

a. With regard to the **language**, the international search was carried out on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.

[ ] the international search was carried out on the basis of a translation of the international application furnished to this Authority (Rule 23.1(b)).

b. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international search was carried out on the basis of the sequence listing :

[ ] contained in the international application in written form.

[ ] filed together with the international application in computer readable form.

[ ] furnished subsequently to this Authority in written form.

[ ] furnished subsequently to this Authority in computer readble form.

[ ] the statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.

[ ] the statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished

2. [ ] **Certain claims were found unsearchable** (See Box I).

3. [ ] **Unity of invention is lacking** (see Box II).

4. With regard to the **title,**

[X] the text is approved as submitted by the applicant.

[ ] the text has been established by this Authority to read as follows:

5. With regard to the **abstract,**

[X] the text is approved as submitted by the applicant.

[ ] the text has been established, according to Rule 38.2(b), by this Authority as it appears in Box III. The applicant may, within one month from the date of mailing of this international search report, submit comments to this Authority.

6. The figure of the **drawings** to be published with the abstract is Figure No. 2

[X] as suggested by the applicant.

[ ] None of the figures.

[ ] because the applicant failed to suggest a figure.

[ ] because this figure better characterizes the invention.

INTERNATIONAL SEARCH REPORT

International Application No
PCT/US 00/02989

A. CLASSIFICATION OF SUBJECT MATTER
IPC 7 H04N3/32 H04N3/27

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC 7 H04N

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	EP 0 784 402 A (MATSUSHITA ELECTRIC IND CO LTD) 16 July 1997 (1997-07-16) column 5, line 15 - line 30 column 6, line 9 - line 26; claims 6,7	1,2,4
A	---	5,12
X	PATENT ABSTRACTS OF JAPAN vol. 010, no. 279 (E-439), 20 September 1986 (1986-09-20) & JP 61 099467 A (SONY CORP), 17 May 1986 (1986-05-17) abstract	1,2,4

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[X] Further documents are listed in the continuation of box C.

[X] Patent family members are listed in annex.

° Special categories of cited documents :

"A" document defining the general state of the art which is not considered to be of particular relevance

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"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

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"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
23 May 2000	30/05/2000

Name and mailing address of the ISA	Authorized officer
European Patent Office, P.B. 5818 Patentlaan 2 NL – 2280 HV Rijswijk Tel. (+31–70) 340–2040, Tx. 31 651 epo nl, Fax: (+31–70) 340–3016	Bequet, T

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C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A ✓	PATENT ABSTRACTS OF JAPAN vol. 012, no. 375 (E-666), 7 October 1988 (1988-10-07) & JP 63 123275 A (MITSUBISHI ELECTRIC CORP), 27 May 1988 (1988-05-27) abstract ---	1,2,4
A	PATENT ABSTRACTS OF JAPAN vol. 012, no. 130 (E-603), 21 April 1988 (1988-04-21) & JP 62 254576 A (HITACHI LTD), 6 November 1987 (1987-11-06) abstract -----	1,2,4

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Information on patent family members

International Application No
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		JP 9270971 A	14-10-1997
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		CN 1168598 A	24-12-1997
		US 5982449 A	09-11-1999
JP 61099467 A	17-05-1986	JP 1925039 C	25-04-1995
		JP 6046784 B	15-06-1994
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JP 62254576 A	06-11-1987	NONE	